ASPECTS OF WEATHER-RELATED CASUALTY TRAFFIC ACCIDENTS, BRITISH COLUMBIA, 1984.

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SUMMARY

In 1984 the 2,587 reported weather-related casualty traffic accidents in British Columbia comprised 11.1% of all casualty traffic accidents, caused 3,270 injuries and 48 deaths, and cost the Insurance Corporation of B.C. approximately $52.6 million in insurance payments for medical and other damages. Weather was the fifth most frequently cited cause of casualty traffic accidents, following Driving Without Due Care (29.1%), Failure to Yield Right of Way (17.5%), Alcohol Involvement (15.2%), and Excessive Speed (15.2%), and in sum totalled nearly the number of pedestrian and motorcycle casualty accidents combined.

In many ways the typical weather-related casualty traffic accident resembles the typical alcohol-related casualty traffic accident: both are high-speed single-vehicle runoffs that occur at night at a curve in the road in rural areas and involve young male drivers. The differences between them are that in the one instance the driver's ability is impaired by the driving conditions (rain, snow, ice) and in the other instance the driver's ability is impaired by alcohol.

Finally, it must be stressed that these casualties must not be treated as if there is nothing that can be done to reduce their number and the attendant expense to the province. Short-term, high-intensity public education during periods of elevated risk can reduce alcohol-related accidents, and there is no compelling reason to assume that the same cannot be accomplished with regard to weather-related accidents. Educational programs and campaigns, combined with improved road surface management, have the potential to significantly reduce weather-related casualty traffic accidents in British Columbia.

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Clearly, weather is a major contributor to casualty traffic accidents in the province. Unfortunately, because there is little one can do about the weather there is a tendency to relegate these accidents to an "Acts of God" classification and then to ignore possible counter-measures. Consequently, it is the purpose of this paper to examine the characteristics of weather-related casualty traffic accidents through an analysis of the Traffic Accident Report Forms (MV104) completed by the investigating police officer and compiled by the Motor Vehicle Department of the B.C. Ministry of Transportation and Highways.

RESULTS

Extent of Problem:

In 1984 weather-related traffic accidents in British Columbia killed 48 persons and injured 3,270 persons. They comprised 11.1% of all casualty traffic accidents and cost I.C.B.C. approximately $52.6 million, calculated at $14,000 per injury and $9,000 per death.

Time, Month:

From Figure 1 it can be seen that weather-related casualty traffic accidents, like casualty traffic accidents that were not weather-related, were most frequent between 4 p.m. and 6 p.m. However, unlike non-weather-related accidents, they also peaked between 7 a.m. and 9 a.m. These two peaks for these weather-related accidents coincide with the dense traffic periods of "rush hour".

From Figure 2 it can be seen that weather-related casualty traffic accidents were most frequent during the fall and winter months and least frequent in the summer, while non-weather-related casualty traffic accidents had the opposite frequency pattern.

Collision Type, # Vehicles, Commercial Vehicles:

Table 1 shows that, when compared to casualty traffic accidents that were not weather-related, weather-related casualty traffic accidents more frequently involved collisions with stationary objects. This fact is reflected by the finding that 52% of these weather-related accidents were single-vehicle-only accidents, as opposed to only 37%

FIGURE 1

Time of Day

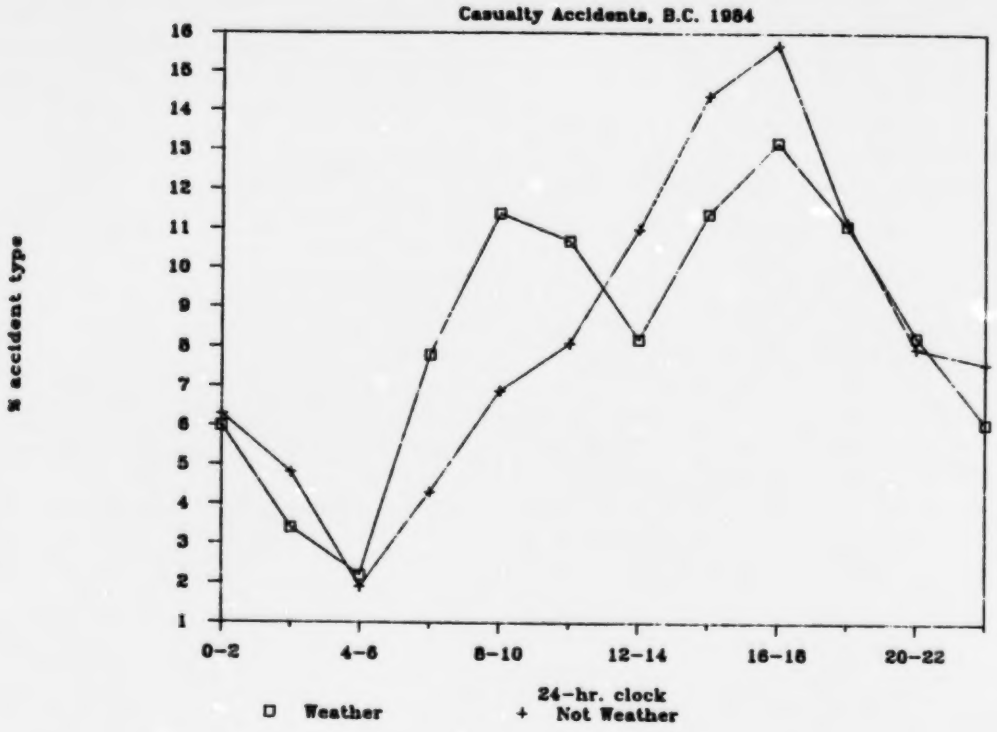

FIGURE 2

Month

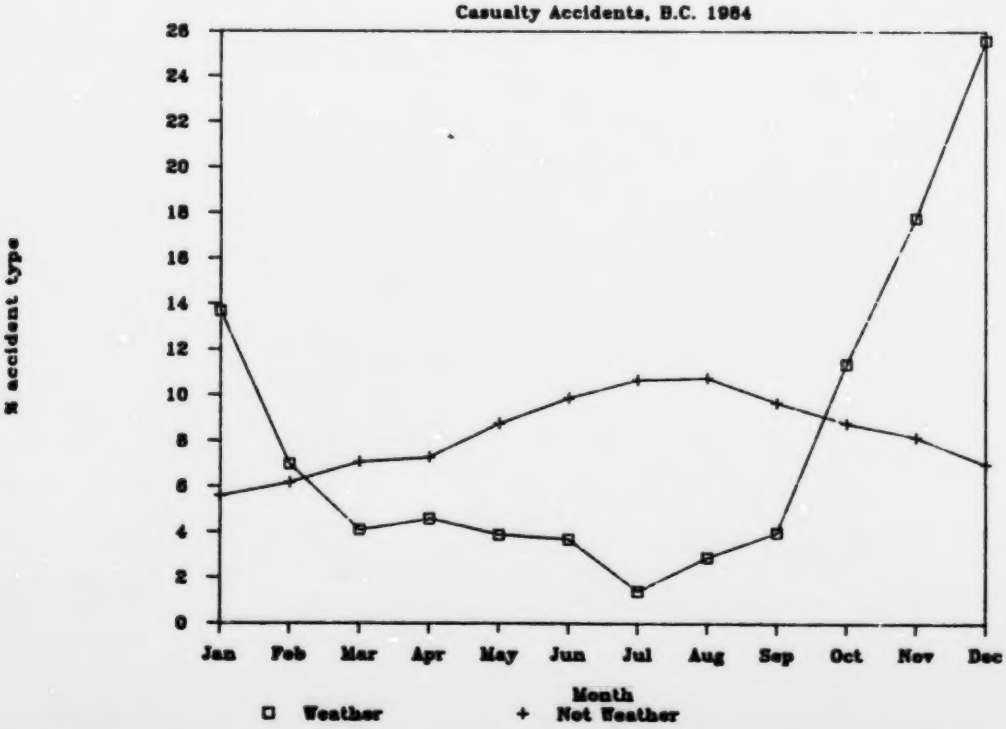

Table 1
% Weather-Related Casualty Traffic Accidents vs. % Not Weather-Related Casualty Traffic Accidents by Collision Type
British Columbia, 1984.

Accident Type	% Other Vehicle	% Motor Cycle	% Pedestrian	% Bicycle	% Other Moving	% Stationary Obj.
Weather-Related	54.0%	1.5%	7.7%	1.7%	0.8%	34.3%
Not Weather Related	57.6%	4.5%	9.5%	8.5%	1.2%	18.7%
Province	57.2%	4.2%	9.3%	7.8%	1.2%	20.3%

Table 2
% Weather-Related Casualty Traffic Accidents vs. % Not Weather-Related Casualty Traffic Accidents by Road Surface
British Columbia, 1984.

Accident Type	% Dry	% Wet	% Mud	% Snow	% Slush	% Ice
Weather-Related	1.7%	49.4%	0.4%	14.3%	6.5%	27.6%
Not Weather Related	67.3%	27.6%	0.1%	1.5%	0.6%	2.9%
Province	60.0%	30.0%	0.2%	2.9%	1.3%	5.6%

Table 3
% Weather-Related Casualty Traffic Accidents vs. % Not Weather-Related Casualty Traffic Accidents by Accident Location
British Columbia, 1984.

Accident Type	Total Number	Location				
		% Intersection	% between inters.	% "T" junction	% bridge	% other
Weather-Related	2,525	30.8%	52.8%	4.2%	4.6%	7.7%
Not Weather Related	20,202	45.6%	39.1%	6.5%	1.8%	7.0%
Province	22,727	44.0%	40.6%	6.2%	2.1%	7.1%

Table 4
% Weather-Related Casualty Traffic Accidents vs. % Not Weather-Related Casualty Traffic Accidents by Land Use in Area
British Columbia, 1984.

Accident Type	% School	% Houses	% Apartments	% Commercial	% Industrial	% Agricultural	% Parks
Weather-Related	2.1%	25.1%	3.8%	18.9%	6.4%	40.9%	2.8%
Not Weather Related	2.8%	30.5%	5.2%	30.0%	6.1%	22.9%	2.4%
Province	2.8%	29.9%	5.0%	28.8%	6.2%	24.9%	2.5%

of the non-weather-related casualty traffic accidents in 1984. As to the sort of vehicle involved, 7.1% of the weather-related and 4.8% of the non-weather-related casualty traffic accidents involved commercial vehicles.

Accident Environment:

In 42% of the weather-related casualty traffic accidents in 1984 in B.C. it was raining at the time of the accident, 21% cloudy, 19% snowing, 14% clear, and 3% foggy. The road surfaces were wet in 49% of the instances, snow or slush in 20%, and ice in 28%, as can be seen from Table 2. As to the lighting, 50.4% of the weather-related casualty traffic accidents occurred between dusk and dawn inclusive, while the figure for non-weather-related casualty traffic accidents was 37.5%.

As can be seen from Table 3, these weather-related accidents occurred more often between intersections (52.8%) than did non-weather-related accidents (39.1%). In addition, they occurred more often in agricultural and less often in commercial and residential areas than did non-weather-related casualty accidents, as is illustrated in Table 4. This latter relationship is reflected in the finding that 44.9% of the weather-related and only 27.7% of the non-weather-related casualty traffic accidents occurred in rural areas.

Finally, weather-related casualty traffic accidents occurred more frequently on curved portions of the road than did non-weather-related casualty traffic accidents

(36.1% vs. 21.9%) and on slopes (46.0% vs. 33.3%).

Contributing Factors:

Table 5 shows that a higher proportion of weather--related casualty traffic accidents involved excessive speed than did non-weather-related casualty traffic accidents (24.5% vs. 14.1%). On the other hand, they involved a lower proportion of Driving Without Due Care (16.6% vs. 30.7%), Failure to Yield the Right of Way (8.5% vs. 18.6%), and Alcohol (6.7% vs. 16.2%).

Driver Age, Gender:

Using the gender of the first driver indicated on the Traffic Accident Report Form, approximately 69% of the weather-related casualty traffic accidents and 72% of the non-weather-related casualty traffic accidents involved male drivers. As to driver age, Figure 3 shows that the proportions of weather-related and non-weather-related casualty traffic accidents parallel each other across age groups, with both types occurring in higher proportions in the younger driver groups.

Geographic Locations:

Table 6 illustrates the proportion of weather-related casualty traffic accidents by police reporting groups throughout British Columbia. Generally, the rural detachments reported a higher proportion of these accidents than did the municipal detachments, although the municipal detachments in the Prince Rupert and Victoria Areas and the Freeway RCMP reported proportions nearly as high as the more rural areas.

Table 5
% Weather-Related Casualty Traffic Accidents vs. % Not Weather-Related Casualty Traffic Accidents by Contributing Factors British Columbia, 1984.

Accident Type	% Due Care	% Not Yield	% Alcohol	% Speeding	% Tailgate	% Vehicle Fault
Weather-Related	16.6%	8.5%	6.7%	24.6%	5.9%	4.1%
Not Weather Related	30.7%	18.6%	16.2%	14.1%	7.7%	4.2%
Province	29.1%	17.5%	15.2%	15.2%	7.5%	4.2%

NOTE: As there are up to three indicated contributing factors per driver, these figures can total to more than 100%.

FIGURE 3

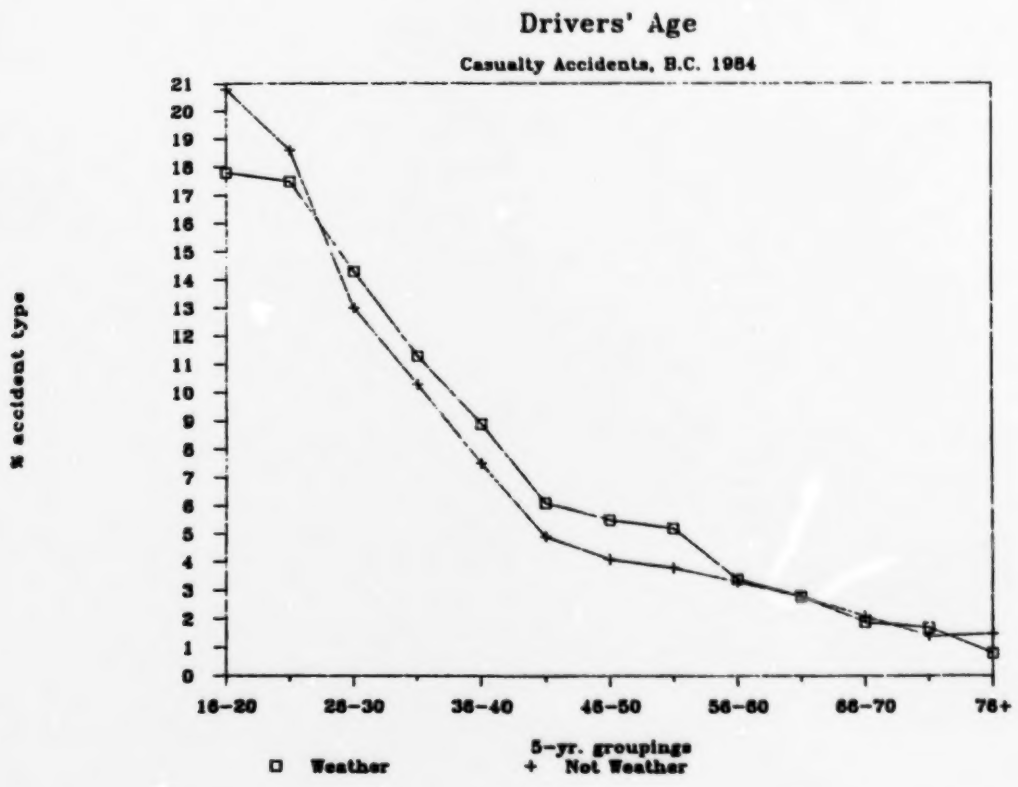

Table 6
% Weather-Related Casualty Traffic Accidents by Police Jurisdiction
British Columbia, 1984.

Police Jurisdiction	Total # Cas. Acc.	% Weather-Related
Kelowna RCMP Subdivision		
Municipal Detachments	912	6.9%
Rural Detachments	995	16.3%
Kamloops RCMP Sub.		
Municipal Detachments	583	6.0%
Rural Detachments	825	19.4%
Nelson RCMP Subidvision		
Municipal Detachments	169	14.8%
Rural Detachments	810	19.3%
Prince George RCMP Sub.		
Municipal Detachments	623	8.0%
Rural Deatchments	846	16.4%
Prince Rupert RCMP Sub.		
Municipal Detachments	178	12.9%
Rural Detachments	441	22.2%
RCMP District 1		
Municipal Detachments	6,250	9.5%
Rural Detachments	789	15.7%
Victoria Area RCMP		
Municipal Detachments	638	11.3%
Rural Detachments	803	12.7%
Courtenay RCMP Sub.		
Municipal Detachments	412	7.8%
Rural Detachments	745	15.4%
Freeway RCMP	604	16.6%
Independent Forces		
Vancouver Area	5,053	8.5%
Victoria Area	1,470	6.7%
Nelson City	36	2.8%
Province	23,182	11.1%

DISCUSSION

In many ways the typical weather-related casualty traffic accident resembles the typical alcohol-related casualty traffic accident: both are high-speed single-vehicle runoffs that occur at night at a curve in the road in rural areas and involve young male drivers. The differences between them are that in the one instance the driver's ability is impaired by the driving conditions (rain, snow, ice) and in the other instance the driver's ability is impaired by alcohol.

Considering countermeasures, again a parallel can be drawn -- if public education as to the effects of the impairing element can reduce alcohol-related accidents, perhaps a similar approach with regard to rainy, snowy and icy weather conditions and how they affect driving and how to cope with them should be undertaken. For example, the public could be made aware of the extra caution and reduced speed that must accompany driving in even moderately bad weather. In addition, as about half of these weather--related accidents occur in conditions of snow, slush or ice, some consideration as to improving these road conditions through ploughing, sanding or salting could prove useful.

Finally, it must be stressed that these casualties must not be treated as if there is nothing that can be done to reduce their number and the attendant expense to the

province. Short-term, high-intensity public education during periods of elevated risk can reduce alcohol-related accidents, and there is no compelling reason to assume that the same cannot be accomplished with regard to weather--related accidents. Educational programs and campaigns, combined with improved road surface management, have the potential to significantly reduce weather-related casualty traffic accidents in British Columbia.